

Date: Tuesday, 14/10/2008 3:39:44 PM  
 User: Julie Lecocq

## Process Sheet

Customer : CU-DAR001 Dart Helicopters Services  
 Job Number : 42597  
 Estimate Number : 10973  
 P.O. Number :  
 This Issue : 14/10/2008 S.O. No. :  
 Prsht Rev. : NC  
 First Issue : // Type : CROSSTUBES  
 Previous Run : 42588  
 Part Number : D206667203  
 Drawing Number : D206-667-243 REVB *DSI 9415*  
 Project Number : N/A  
 Drawing Revision : B  
 Material :  
 Due Date : 30/10/2008 Qty: 1 Um: Each

Written By :  
 Checked & Approved By : *JLD 08-10-14*  
 Comment : Est Rev:F 05.09.01 Add holes for compatibility with Bell  
 Skidtubes KJ/JLM  
 Est Rev:G 08-06-03 update as per DSI9415 (ECN1198) DD  
 verified by:ec  
 Est Rev:H 08-07-18 remove thread masking in step 12 DD  
 verified by:EC

## Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 DC DOCUMENT CONTROL



*JLD 08.10.20*



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D206-667-203 CHG003

2.0 D206667203TRN Crosstube Turning Detail



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch *542540*

*DP/MP 08-10-28*

3.0 BENDING BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

Bend tube as per Dwg D206-667-243 using CNC bender program 206L-AF and Folio FT

*DP/MP 08-10-28*

4.0 QC15 DIMENSIONAL CHECK OF X-TUBES



Comment: DIMENSIONAL CHECK OF X-TUBES

*S 08/10/28*

5.0 CROSSTUBES CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D206-667-243. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D206-667-243

*DP/MP 08-10-29*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L AFT X-TUBE

Job Number: 42597

Part Number: D206667203

Job Number:



Seq. #:	Machine Or Operation:	Description :
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Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D206-667-243. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D206-667-243

6-Drill Fwd rivet holes using drill Jig DT8789FWD as per Dwg D206-667-143. Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D206-667-243.

8-C'sink holes as per Dwg D206-667-243.

9-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-243

10-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-243  
Inside of Cuff (Do not engrave on outside of tube)

*Handwritten:* MB 08-10-29

*Handwritten:* - ANM 8-10-29

*Handwritten:* MB 08-10-29

6.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



*Handwritten:* ANM 8-10-30



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

7.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

*Handwritten:* S 08/10/31 (40)

8.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

*Handwritten:* S 08/10/31 (40)

9.0

OUTSIDE SERV.11

OUTSIDE SERVICE -CROSSTUBES



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038 Or

Issue P/O: 7504

LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

*Handwritten:* C808/11/030

W/O:		WORK ORDER CHANGES					
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Drawing Name: 206L AFT X-TUBE

Job Number: 42597

Part Number: D206667203

Job Number:



Seq. #: Machine Or Operation: Description :

10.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

11.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: Inspect work to current step & ensure results are as per Dwg D206-667-243

12.0 SPRAY PAINTING SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

13.0 QC14 INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

14.0 D2873045 Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-045 Nut Plate 38316

15.0 D2873043 Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-043 Nut Plate 40218

16.0 MS20601AD4W10 RIVET



Comment: Qty.: 14.0000 Each(s)/Unit Total: 14.0000 Each(s)

Pick:

Qty Part number Description Batch

14 MS20601AD4W10 Rivet 108673

W/O:		WORK ORDER CHANGES					
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Part Number: D206667203

Job Number:



Seq. #:

Machine Or Operation:

Description :

17.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install nut plates as per Dwg D206-667-243.

RT 08-11-03

18.0

D3595075450

RUBBER CUSHION .75" x 4.50



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

RUBBER CUSHION .75" x 4.50

B 40221 RT 0811-04

19.0

D28921

Support



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2892-1

Support

35581

RT 08 11-04

20.0

MS2192022

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-22

Clamp

107356

RT 08-11-04

21.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI-035 using DT8580. Note: (3) top holes should be facing up.

2-Install supports and clamps as per Dwg D206-667-243 Torque clamps to 80-100 in lb

MAGNABOND 6398

B/N 108966

RT 08-11-04

22.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

J 08/10/08

W/O:		WORK ORDER CHANGES					
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Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Job Number: 42597

Part Number: D206667203

Job Number:



Seq. #: Machine Or Operation: Description :

23.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1  
Pick Packing Kit

24.0

AN534A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)  
Bolt  
Batch: M109001

25.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)  
Nut  
Batch: M108827

26.0

AN510A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total: 10.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
10 AN5-10A Bolt M108990

27.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
4 AN5-32A Bolt M109068

28.0

AN960JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total: 18.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
18 AN960JD516 Washer M109059

W/O:		WORK ORDER CHANGES					
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Job Number: 42597

Part Number: D206667203

Job Number:



Seq. #:

Machine Or Operation:

Description :

29.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

08.11.11 (1)

30.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D206-667-203

Location: 63

PPP Rev: D

8/11/11

SC

31.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

08/11/12

Job Completion



MF 08-11-12

D206667203 B42597

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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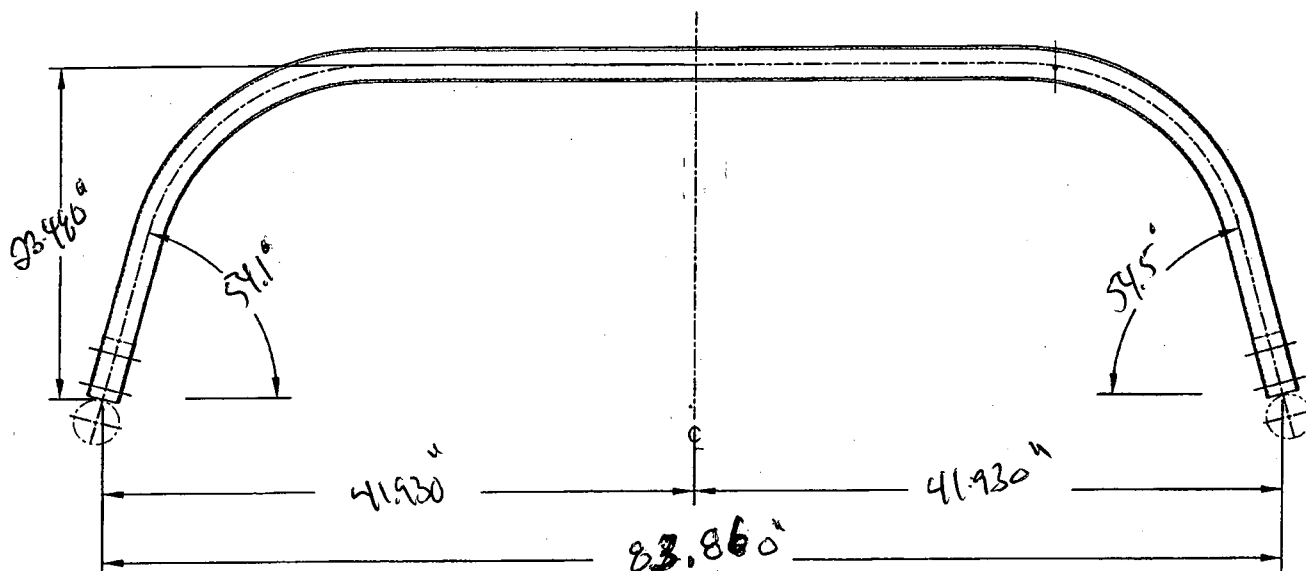
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**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 42597	
<b>Description:</b> Crosstube High Aft (206L)		<b>Part Number:</b> D206-667-203	
<b>Inspection Dwg:</b> D206-667-243		<b>Rev:</b> B	<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	41.86	41.98
Angle	54	56
Total Span	83.72	83.96



Comments

QC15 Inspection	
Date	06/10/28

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	

W/O:		WORK ORDER CHANGES					
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**DART**

DESIGN PH	DRAWN BY PH	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED # DS	APPROVED # DS	DRAWING NO. D206-667-243	REV. B SHEET 1 OF 3
DATE 05.07.26		TITLE CROSSTUBE ASS'Y (206L HIGH AFT)	SCALE NTS
A	00.11.17	NEW ISSUE	
B	05.07.26	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	

RELEASED  
05.07.26 - #**UNDER REVIEW**

06.03.10/RT

re draw detail F

CP 10.10.15

Qty	Part Number	Description
X	D206-667-243	CROSSTUBE ASSEMBLY
1	D6004-115	CROSSTUBE
<del>2</del>	<del>D2856-400-773</del>	<del>ABRASION STRIP</del>
2	D2873-043	NUT PLATE
2	D2873-045	NUT PLATE
2	D2892-1	SUPPORT
14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
4	MS21920-22	CLAMP

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6004-115  
FINISHED LENGTH =  $104.91 \pm 0.020$
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL ~~D2856-400-773~~ ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2892-1 SUPPORT, PER QSI 038.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) IT IS OPTIONAL TO SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

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WORK ORDER  
42597

CP 08.10.15

PER QSI 9415

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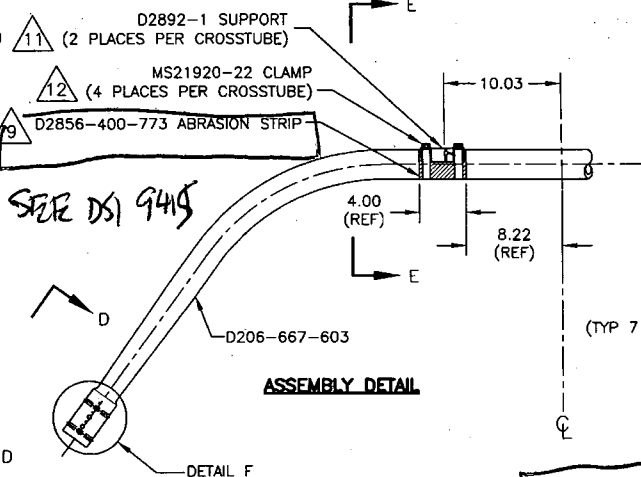
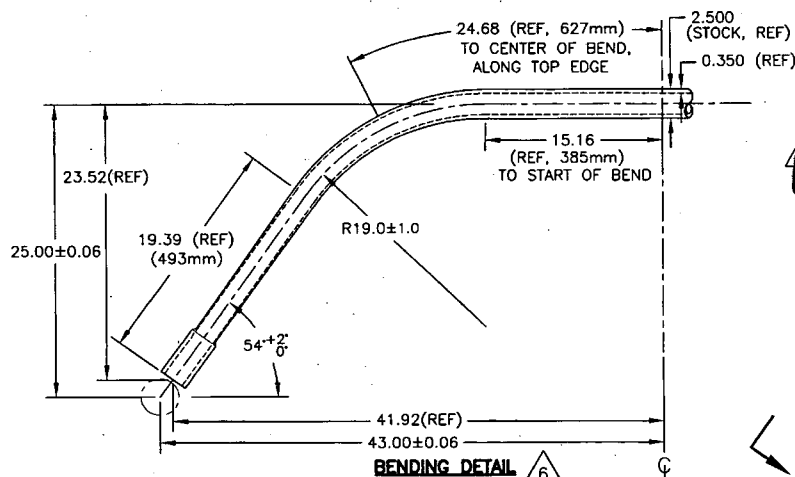
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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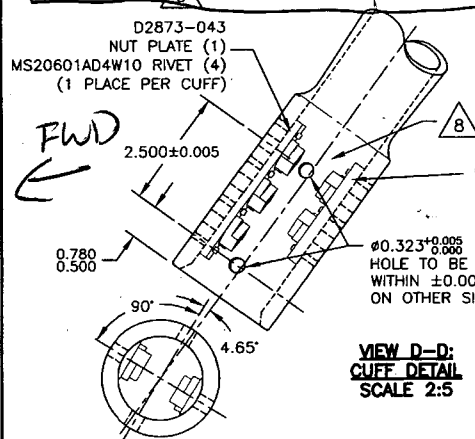
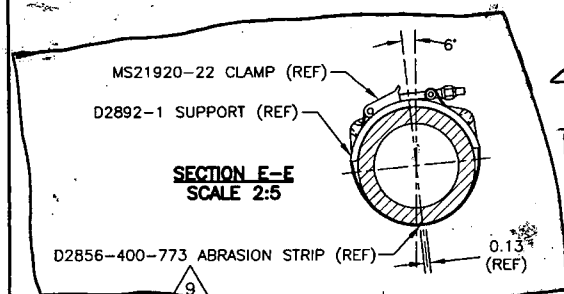


**B**  $\phi 0.323^{+0.005}_{-0.000}$   
(TYP 5 PLACES PER CUFF)  
HOLE TO BE ALIGNED WITHIN  $\pm 0.001$  OF HOLE ON OTHER SIDE OF CUFF

PILOT  $\phi 0.128$   
C'SINK  $\phi 0.225 \times 100'$   
(TYP 7 PLACES PER CUFF)

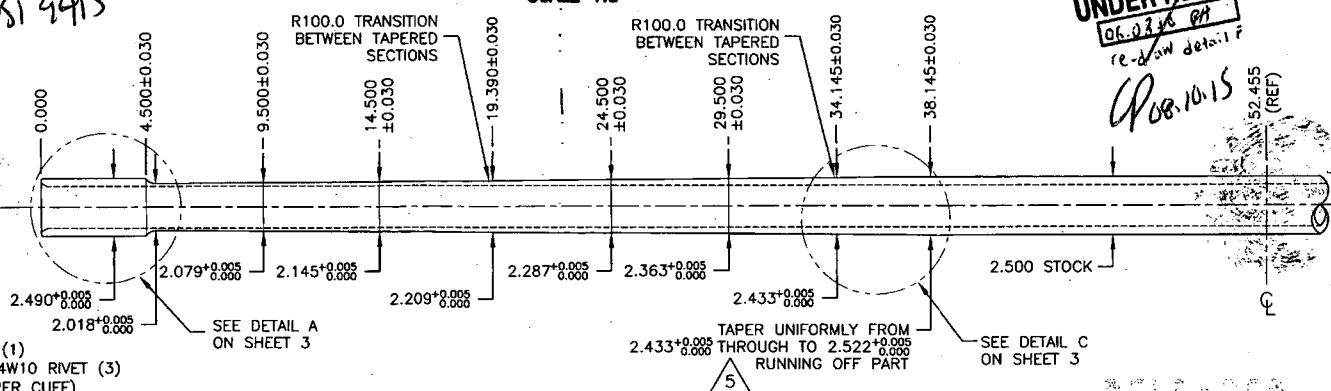
**DETAIL F**  
SCALE 2:5

**UNDER REVIEW**  
06.03.16 PH  
re-draw detail F  
06.10.15



SEE  
DSI 9415

**TURNING DETAIL**  
SCALE 1:5



**VIEW D-D:**  
**CUFF DETAIL**  
SCALE 2:5

NO. 42547  
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THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED	DS	APPROVED	DS	DRAWING NO.	REV. B
		DATE	05.07.26			D206-667-243	SHEET 2 OF 3
						TITLE	SCALE
						CROSSTUBE ASS'Y (206L HIGH AFT)	1:10

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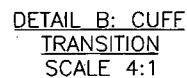
**NOTE:** Date & initial all entries

05.07.26

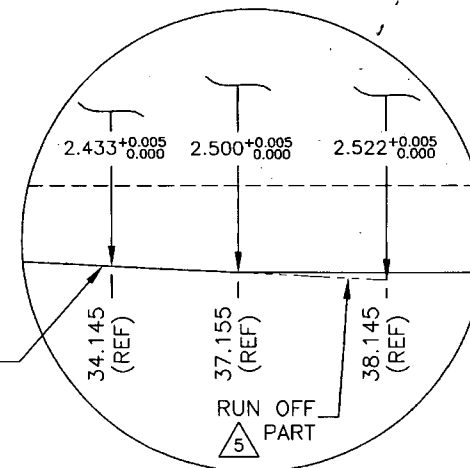


06.03.10 11:15  
re-drawn detail in


08.10.15



## R100.0 (REF)



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DRAWN BY	PH
APPROVED	 DS

DRAWING NO.	D206-667-243
TITLE	CROSSTUBE ASS

REV. B  
SHEET 3 OF 3  
SCALE  
1:1

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# DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 REV. C AND  
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D206-667 REV. D  
REF: CANADIAN STC: SH01-5  
REF: FAA STC: SR01304NY

For D206-667-101/-201/-103/-203 or D407-667-105 cross tubes at CHG 003 or later, the D2856-400-694/773 abrasion strip has been removed, the center D2891-1 or D2892-1 support has been bonded onto the crosstube using Magnabond 6398 and D3595-075-395/-450 Rubber Cushions have been installed underneath the MS21920-20/-22 Clamps. Amend parts list of the IIN-D206-667 section 5 and ICA-D206-667 Section 32.8 as follows:

### REMOVE:

ITEM	QTY -101	QTY -201	QTY -103	QTY -203	QTY -105	PART NUMBER	DESCRIPTION
13	2	2	2		2	D2856-400-694	ABRASION STRIP
14				2		D2856-400-773	ABRASION STRIP

### ADD:

ITEM	QTY -101	QTY -201	QTY -103	QTY -203	QTY -105	PART NUMBER	DESCRIPTION
24	4	4	4		4	D3595-075-395	RUBBER CUSHION
25				4		D3595-075-450	RUBBER CUSHION

To prevent the supports from shifting on the D206-667-101/-201/-103/-203 or D407-667-105 crosstubes at CHG 002 or earlier, the D2891-1/D2892-1 supports should be removed and re-installed as follows:

- 1) Follow section 32.1 of ICA-D206-667 for the removal of the crosstubes from the helicopter.
- 2) Remove the qty (2) MS21920-20/-22 clamps from the crosstube that fasten the D2891-1/D2892-1 supports to the crosstube.
- 3) Remove the D2856-400-694/-773 abrasion strip from the crosstube per section 32.5 of ICA-D206-667.
- 4) Inspect the crosstube surface underneath the support for corrosion and mechanical damage per items 5.3.1 and 5.3.2 of the 300 hour inspection of ICA-D206-667. Repair damage within acceptable limits per item 5.3.3 of the 300 hour inspection in ICA-D206-667. Touch up finish per item 5.3.9 of the 300 hour inspection.
- 5) Abrade area to which support will be applied with 400 grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe area until there is no residue.
- 6) Apply a 0.03" to 0.06" thick layer of Magnabond 6398 underneath the D2891-1/D2892-1 support and re-install the support on the crosstube as shown in Figure 1. Position and secure the D2891-1/D2892-1 support on the crosstube using MS21920-20/-22 Clamps. Install a D3595-075-395/-450 Rubber cushion underneath each MS21920-20/-22 Clamp. Torque clamps 80-100 in-lb. Let the D206-667-101/-201/-103/-203 or D412-667-105 crosstube assembly cure as per the Magnabond 6398 instructions before re-installing the crosstube on the aircraft.

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

### APPROVED

BY: D. Shepherd  
D. SHEPHERD (DE # 02)

DATE: 08.05.26  
CERT. NO.: SH01-5  
ISSUE NO.: 3

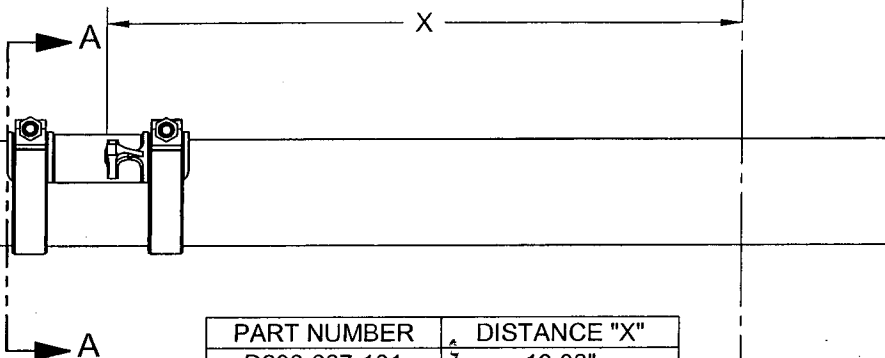
A	NEW ISSUE	HS	08.05.26
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MFG. APPR.	EP	DSI 9415	SHEET 1 OF 2
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7) Re-install the D206-667-101/-201/-103/-203 or D412-667-105 crosstube per section 32.2 of ICA-D206-667.

For customers who would like to upgrade their D206-667-101/-201/-103/-203 or D412-667-105 crosstubes from CHG 002 or earlier to CHG 003, the following kit can be obtained from Dart:

QTY -011	QTY -013	PART NUMBER	DESCRIPTION
X		DSI 9415-011	CROSSTUBE SUPPORT CHANGE (USABLE ON D206-667-101/-201/-103 OR D407-667-105)
	X	DSI 9415-013	CROSSTUBE SUPPORT CHANGE (USABLE ON D206-667-203)
4		D3595-075-395	RUBBER CUSHION
	4	D3595-075-450	RUBBER CUSHION

CROSSTUBE  
D206-667-101  
D206-667-201  
D206-667-103  
D206-667-203  
D407-667-105  
REF



PART NUMBER	DISTANCE "X"
D206-667-101	13.08"
D206-667-201	13.08"
D206-667-103	13.08"
D206-667-203	10.03"
D407-667-105	13.08"

D2891-1 OR D2892-1  
SUPPORT

CROSSTUBE  
D206-667-101  
D206-667-201  
D206-667-103  
D206-667-203  
D407-667-105  
REF

MS21920-20/-22  
CLAMP

MAGNABOND 6398 BETWEEN D2891-1/D2892-1  
SUPPORT AND CROSSTUBE

D3595-075-395/-450 RUBBER CUSHION  
(REF) (2 PLACES)

### SECTION A-A

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**FIGURE 1 - CROSSTUBE SUPPORT**

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

APPROVED

BY: *D. Shepherd*  
D. SHEPHERD (DE # 02)

DATE: 08.05.26  
CERT. NO.: SH01-5  
ISSUE NO.: 3

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MFG. APPR.	<i>E</i>	DSI 9415	SHEET 2 OF 2
APPROVED	<i>UP</i>	TITLE	SCALE
DE APPR.	<i>UP</i>	CROSSTUBE SUPPORT CHANGE	NTS
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